

WHAT IS CLAIMED IS:

1. A device for sensing the level of a fluid in a reservoir, said device comprising:

5 (a) means for applying a first electric potential of predetermined value to said fluid within said reservoir for a predetermined duration,

(b) means for measuring the effect of said fluid on said first electric potential, and

(c) means for applying to said fluid a second electric potential after step (b)
10 for a period of time substantially equivalent to the predetermined duration of step (a) and at a value substantially equivalent to and opposite to the predetermined value of said first electric potential.

2. A device according to Claim 1 wherein said means of (a) and (c)
15 comprise a switching circuit.

3. A device according to Claim 2 wherein said means of (a) and (c) comprise a ground generator.

20 4. A device according to Claim 1 wherein said means of (b) comprises a sense circuit.

5. A device according to Claim 1 wherein said means of (b) comprises an electrode for placing in said reservoir.

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6. A device according to Claim 1 further comprising a latch circuit.

7. A method for sensing the level of a fluid in a reservoir, said method employing the device of Claim 1 and comprising:

30 (a) applying a first electric potential to an electrode within said reservoir, said first electric potential having a predetermined value and duration,

(b) measuring resistance of said fluid within said reservoir during application of said first electric potential, and

(c) applying a second electric potential to said electrode after said measurement for a period of time substantially equivalent to the duration of said first electric potential and of a value substantially equivalent to and opposite to the predetermined value of said first electric potential.

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8. An apparatus for synthesizing an array of biopolymers on the surface of a support, said apparatus comprising:

(a) a plurality of reservoirs for containing reagents for synthesizing said biopolymers,

10 (b) a droplet dispensing device comprising a plurality of droplet dispensers, each in fluid communication with a respective reservoir,

(c) a plurality of fluid level sensors, one for each of said reservoirs, wherein each of said fluid level sensors is a device according to Claim 1, and

(d) a mechanism for moving a substrate with respect to said droplet
15 dispensing device.

9. A fluid dispensing apparatus comprising:

(a) a plurality of reservoirs,

(b) a droplet dispensing device comprising a plurality of droplet dispensers,
20 each in fluid communication with a respective reservoir,

(c) a plurality of fluid level sensors, one for each of said reservoirs, wherein each of said fluid level sensors is a device according to Claim 1.

10. A fluid dispensing apparatus comprising:

25 (a) a plurality of reservoirs,

(b) a droplet dispensing device comprising a plurality of droplet dispensers, each in fluid communication with a respective reservoir,

(c) a plurality of fluid level sensors, one for each of said reservoirs, wherein each of said fluid level sensors is a device according to Claim 2.

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11. A fluid dispensing apparatus comprising:

(a) a plurality of reservoirs,

(b) a droplet dispensing device comprising a plurality of droplet dispensers, each in fluid communication with a respective reservoir,

(c) a plurality of fluid level sensors, one for each of said reservoirs, wherein each of said fluid level sensors is a device according to Claim 3.

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12. A method for synthesizing an array of biopolymers on a surface of a substrate, said method comprising, in multiple rounds of subunit additions, adding one or more polymer subunits at each of multiple feature locations on said surface to form one or more arrays on said surface, each round of subunit additions comprising:

10 (a) bringing said substrate and a dispensing system for dispensing said polymer subunits for the synthesis of said biopolymers into a dispensing position relative to said feature locations on said surface, said dispensing system comprising a plurality of reservoirs and a droplet dispensing device comprising a plurality of droplet dispensers, each of said dispensers in fluid communication with a respective reservoir,

15 (b) dispensing said polymer subunits to said feature locations,

(c) repeating steps (a) – (b).

wherein the level of liquid reagent in each of said reservoirs is sensed at predetermined intervals by a method comprising:

20 (i) applying a first electric potential to an electrode within said reservoir, said first electric potential having a predetermined value and duration,

(ii) measuring resistance of said liquid reagent within said reservoir during application of said first electric potential, and

25 (iii) applying a second electric potential to said electrode after said measurement for a period of time substantially equivalent to the duration of said first electric potential and of a value substantially equivalent to and opposite to the predetermined value of said first electric potential.

13. A method according to Claim 12 wherein said biopolymers are polynucleotides or polypeptides.

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14. A method according to claim 13 further comprising exposing the array to a sample and reading the array.

15. A method comprising forwarding data representing a result obtained from a reading of an array exposed according to the method of Claim 14.

16. A method comprising transmitting to a remote location data representing
5 a result of an interrogation obtained by reading of an array exposed according to the method of Claim 14.

17. A method comprising receiving data representing a result of an
interrogation obtained by reading of an array exposed according to the method of Claim
10 14.

18. A method according to Claim 13 wherein multiple arrays are synthesized
on the surface of said substrate and said substrate is diced into individual sections
comprising one or more arrays.

19. A method according to Claim 12 further comprising after step (b)
removing said substrate and/or said dispensing system from said relative dispensing
position.

20. A method for synthesizing an array of biopolymers on a surface of a
substrate, said method comprising, in multiple rounds of subunit additions, adding one
or more polymer subunits at each of multiple feature locations on said surface to form
one or more arrays on said surface, each round of subunit additions comprising:

(a) bringing said substrate and a dispensing system for dispensing said
25 polymer subunits for the synthesis of said biopolymers into a dispensing position
relative to said activated discrete sites on said surface, said dispensing system
comprising a plurality of reservoirs and a droplet dispensing device comprising a
plurality of droplet dispensers, each of said dispensers in fluid communication with a
respective reservoir,

30 (b) dispensing said polymer subunits to said discrete sites,

(c) removing said substrate and/or said dispensing system from said relative
dispensing position, and

(d) repeating steps (a) – (c).

wherein the level of liquid reagent in each of said reservoirs is sensed at predetermined intervals by a method comprising applying a symmetrical pulse of electric potential to an electrode within said reservoir, said symmetrical pulse comprising first and second electric potentials of equal intensity and duration but opposite value, wherein resistance
5 of said liquid reagent within said reservoir is measured only during application of said first electric potential.

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